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I. Wissenschaftliche Mittheilungen.

1. The Mesogloeal cells of Alcyonium (preliminary account).

By Edith M. Pratt, Owens College Manchester.

(With 4 figs.)

eingeg. 4. Mai 1902.

While working at the anatomy of certain species of Alcyonaria hitherto included in the genus *Lobophytum*, I observed that the stellate and spindle-shaped cells and fibrils which form the socalled mesogloeal "nerve plexus" are remarkably numerous and of an unusually large size.

In his account of the anatomy of *Alcyonium* (Quart. Journ. Micr. Sc. Vol. 37. pl. IV. p. 371.) Hickson calls attention to the fact, that while this system of cells and fibrils has not been experimentally shown to be nervous in function, yet it is undoubtedly homologous with the larger called "Nervenschicht" by the Hertwig's in the *Actiniae*.

In order to determine the function of this system of cells it was necessary that experiments should be made on living material, and as it is impossible to obtain living specimens of any species of *Lobophytum* in England, my observations have been limited to a study of the British genus *Alcyonium*.

At Port Erin, Isle of Man. I was fortunate in obtaining numerous

specimens of the yellow and white varieties of *Alcyonium digitatum*. Thin free-hand sections were made and examined with fairly high powers of the microscope, when the stellate cells of the mesogloea could be easily observed. A single amoeboid cell was under observation and sketched at intervals of about twenty minutes for from one to two hours. The cell which appears to have no definite cell membrane was then seen to change its shape, and by withdrawing and thrusting out pseudopodia, which are really the "fibrils" of the socalled "nerve plexus", wander in a definite course through the mesogloea. About a dozen living cells were examined and sketched in this manner and

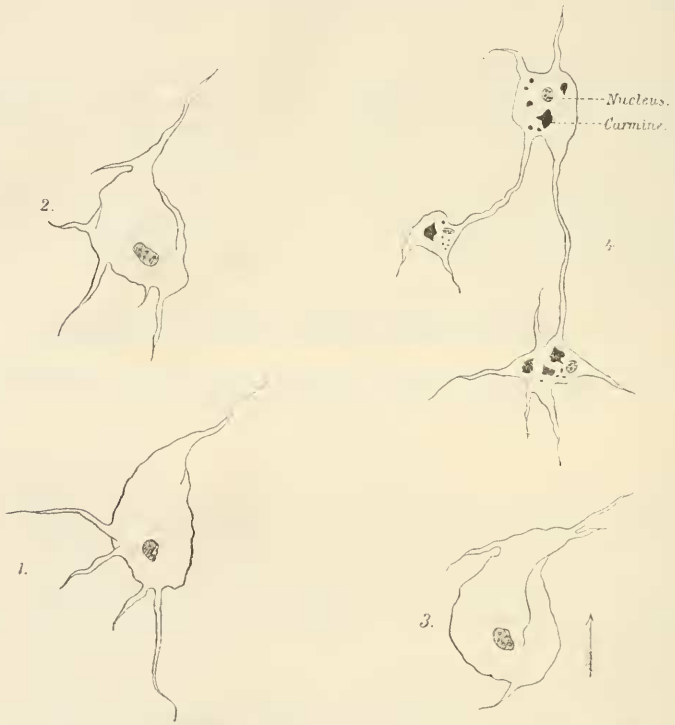

Fig. 1, 2, 3. Sketch of a single amoeboid cell in mesogloea. An interval of half an hour intervened between each drawing. The cell appears moving in an upward direction (indicated by arrow).
Fig. 4. Stellate cell in mesogloea. Particles of Carmine shown in black.

in every case they were observed to be "Amoeboid". Figures 1, 2 and 3. are sketches of a single amoeboid cell at intervals of half an hour. The cell appears to be moving in a upword direction (indicated by arrow).

On the advice of Professor Hickson I carried out the following experiment — Minute particles of carmine were suspended in the

sea-water in which living colonies of *Alcyonium* were kept. By means of a pipette, clouds of carmine were squirted about the expanded polyps. After three days thin free-hand sections were cut and examined as before, when minute particles of carmine were seen included in the endoderm cells lining the walls of the polyp.

It is interesting to note that some of these cells were seen to slowly thrust out one or more pseudopodial processes i. e. to enter an amoeboid phase. (Endoderm cells of the polyps with pseudopodial processes were also observed in microtome sections of preserved specimens of *Lobophytum densum* after staining with borax carmine or Delafield's Haematoxylin.)

After 4—7 days (the time varied in individual colonies) minute particles of carmine were observed

1) in the cells of the endoderm canals in the mesogloea
2) - - - - - solid cords of endoderm in the mesogloea (in both instances some of the cells were seen to become amoeboid)
3) in the stellate and spindle shaped cells of the mesogloea (see fig. 4 in which the carmine particles are shown in black).

The conveyance of solid particles of carmine from the cavity of the coelenteron of a polyp to portions of a colony apart and even remote from the polyps, the fact that the endoderm cells frequently become amoeboid, and the "amoeboid" character of the mesogloeal cells afford substantial evidence that the socalled "nerve cells" of the mesogloea are endoderm cells which have become amoeboid and wandered into the mesogloca.

As a stimulus affecting one polyp may be transmitted with gradually diminishing effect to its neighbours, it is probable that stimuli or impulses travel through the system of amoeboid cells, but the presence of carmine in these cells naturally suggests that they may also take up food or excreta. It is very probable that the amoeboid cells are nutritive and excretory as well as nervous in function, and may therefore be looked upon as neuro-phagocytes.

It is well known that in the embryonic stages of higher forms of life, ganglion cells have a certain power of movement through the tissues, but we have no reason for believing that nerve cells retain this power when maturity is reached.

As we have no experimental evidence that the Alcyonaria are more nervously sensitive than other lowly organised groups, it seems impossible to regard this extremely well developed system of amoeboid cells with coalescing pseudopodia as a specially differentiated "nerve plexus".

In their amoeboid character and multiple functions, the stellate

cells of the mesogloea afford a strong resemblance to the phagocytes occurring in other groups, to which they are doubt-less analagous.

The apparent lack of differentiation in their structure and function must be considered as a secondary feature in that certain cells at one time forming a constitutional part of the endoderm have reverted to a more primitive amoeboid condition in which they are capable of fulfilling any function which the demands of the colony may require them to perform.

2. Zur Kenntnis der Gastropodenaugen.

(Vorläufige Mittheilung.)

Von Robert Bäcker.

eingeg. 8. Mai 1902.

Im October 1900 wurde auf Anregung meines verehrten Lehrers, Herrn Prof. Dr. B. Hatschek, eine histologische Untersuchung der Gastropodenaugen begonnen, um einige umstrittene Fragen, den feineren Bau dieser Organe anlangend, so namentlich die Frage nach der Bedeutung der beiden die Retina constituierenden Zellarten, Pigmentzellen und pigmentlose Zellen, der Entscheidung zuzuführen. Da die Drucklegung der vollständigen Arbeit sich wohl noch eine Zeit lang hinziehen dürfte, sehe ich mich veranlaßt, die Hauptergebnisse derselben schon jetzt in Kürze mitzutheilen.

Von den beiden Zellarten, die constant die Retina der Gastropoden zusammensetzen, kommt nur den pigmentlosen Zellen die Bedeutung von Sinneszellen zu. Diese im Allgemeinen kolben- oder birnförmig gestalteten Zellen ziehen sich basalwärts in eine Nervenfaser, distal in einen verschieden gestalteten, gegen die Füllmasse des Auges vorspringenden Fortsatz aus, auf den in der Zelle zu beobachtende Fibrillen, die wohl zweifellos Neurofibrillen im Sinne Apáthy's darstellen, continuierlich übergehen. Diese Fortsätze (Stäbchen) beziehungsweise die letzten Endigungen der Neurofibrillen in ihnen, sind als die eigentlichen erregbaren, die lichtrecipierenden Elemente der Sehzellen anzusehen. Die Stäbchen finden sich in verschiedenster Ausbildung: als Stiftchensäume (*Helix*, *Arion*, *Limax*), wie sie Hesse in den mannigfachsten Modificationen bei den verschiedensten Thiergruppen gefunden hat, als echte kolbige oder cylindrische Stäbchen mit einem Bündel einstrahlender Neurofibrillen (*Aporrhais*) oder einer einzigen Axialfibrille (*Haliotis*).

Dagegen weisen die Pigmentzellen nichts auf, was für ihre nervöse Natur sprechen könnte. Helle Achsen, wie sie Babuchin und Carrière in den Pigmentzellen beobachtet haben, sind bei *Haliotis*